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| 09/829,797 | 04/10/2001 | Zhongning Liang | NL 000195 | 1904 |

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EXAMINER

LEWIS, MONICA

ART UNIT PAPER NUMBER

2822

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/829,797

Applicant(s)

LIANG ET AL.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 22 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

1. This office action is in response to the request for continued examination filed January 29, 2004.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/29/04 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

4. The objection to Figure 3 has been withdrawn.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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6. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Ker et al. (U.S. Patent No. 6,633,087).

In regards to claim 1, Ker et al. ("Ker") discloses the following:

a) a bond pad disposed above a layered structure that increases structural integrity of the bond pad structure (For Example: See Column 3 Lines 39 and 40);

b) layered structure comprises a top and bottom metal layer (250 and 210) (For Example: See Figures 3 and 4);

c) a plurality of intermediate metal layers (240, 230 and 220) (For Example: See Figures 3 and 4);

d) at least one layer of dielectric material (212, 222, 232, 242 and 252) (For Example: See Figures 3 and 4); and

c) a plurality of equally spaced parallel via lines (214, 224, 234 and 244) that connect the top and bottom metal layers and partition the at least one dielectric area to form isolated areas filled with dielectric material and wherein each intermediate metal layer is divided into a plurality of separated segments that form t-shaped cross sections with the via lines (For Example: See Figures 3 and 4).

In regards to claim 3, Ker discloses the following:

a) a stack of layered structures is present (For Example: See Figures 3 and 4).

In regards to claim 4, Ker discloses the following:

a) the metal layer in each layered structure is a metal plate (For Example: See Figures 3 and 4).

In regards to claim 5, Ker discloses the following:

a) the top and bottom metal layers of the stack are metal plates and the intermediate metal layer or layers are parallel metal lines (For Example: See Figures 3 and 4).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as obvious over Ker et al. (U.S. Patent No. 6,633,087) in view of Kida et al. (U.S. Patent No. 6,313,540).

In regards to claim 2, Ker fails to disclose the following:

a) the via lines are lines of tungsten.

However, Kida discloses tungsten via lines (For Example: See Column 4 Lines 37-39). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Ker to include tungsten via lines as disclosed in Kida because it aids in providing an electrical connection (For Example: See Abstract).

Additionally, since Ker and Kida are both from the same field of endeavor, the purpose disclosed by Ker would have been recognized in the pertinent art of Kida.

In regards to claim 7, Ker fails to disclose the following:

a) the via lines are patterned in the form of a grid.

However, Kida discloses via lines patterned in the form of a grid (For Example: See Figures 7a-7h). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Ker to include via lines patterned in the form of a grid as disclosed in Kida because it aids in minimizing breakage (For Example: See Column 5 Lines 23-42).

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Additionally, since Ker and Kida are both from the same field of endeavor, the purpose disclosed by Kida would have been recognized in the pertinent art of Ker.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as obvious over Ker et al. (U.S. Patent No. 6,633,087) in view of Saran et al. (U.S. Publication No. 2002/0187634).

In regards to claim 6, Kida fails to disclose the following:

a) the metal lines are patterned in the form of a grid.

However, Saran discloses metal lines in the form of a grid (For Example: See Paragraph 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Ker to include metal lines in the form of a grid as disclosed in Saran because it aids in serving as reinforcement for the dielectric layer (For Example: See Figure 5).

Additionally, since Ker and Saran are both from the same field of endeavor, the purpose disclosed by Saran would have been recognized in the pertinent art of Ker.

Conclusion

10. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Lu et al. (U.S. Patent No. 6,100,573) discloses a bonding pad structure; b) Lee et al. (U.S. Publication No. 2001/0000928) discloses a bond pad structure; c) Cook et al. (U.S. Patent No. 6,022,791) discloses a crack stop; d) Sato (U.S. Patent No. 5,739,587) discloses a bonding pad structure; e) Zhao (U.S. Patent No. 6,198,170) discloses a bonding pad; and f) Freeman et al. (U.S. Patent No. 5,149,674) discloses a bond pad structure.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

March 18, 2004

A handwritten signature in black ink, appearing to read 'Mary Wilczewski', with a stylized flourish at the end.

Mary Wilczewski
Primary Examiner